

unload the ischemic ventricle. The aim of this study is to evaluate the role of coronary perfusion pressure and other left ventricular hemodynamics to predict cardiovascular collapse following PCI.

**METHODS** We retrospectively analyzed all patients who underwent PCI for acute coronary syndrome (ACS) from 2003 to 2016 and excluded those without a documented left ventricular end diastolic pressure (LVEDP) or those with a diagnosis of shock. Coronary perfusion pressure was calculated for each patient and defined as the difference in mean arterial pressure and LVEDP. Logistic regression analysis was performed to determine predictor of composite outcome of in-hospital mortality, myocardial infarction (MI), congestive heart failure (CHF), and cardiogenic shock.

**RESULTS** A total of 921 had PCI with an LVEDP measurement and no diagnosis of shock. The average age was 58 years, 590 (64%) were male, 431 Caucasian (47%), 735 (80%) had hypertension, 333 (36%) had diabetes mellitus, 289 (31%) had prior history of coronary artery disease, 86 (10%) had chronic renal insufficiency (CRI), and 239 (26%) had a history of CHF, 227 (25%) presented with ST-elevation MI (STEMI), while 694 (75%) underwent PCI for unstable angina or non-Q-wave MI. The mean LVEDP was  $20 \pm 8.6$  mmHg, mean systolic aortic blood pressure was  $117 \pm 41$  mmHg, and perfusion pressure was  $72 \pm 19$  mmHg. The mean LVEDP was significantly higher in the STEMI patients ( $24 \pm 9$  vs  $19 \pm 8$  mmHg,  $p < 0.01$ ) and perfusion pressure significantly lower ( $68 \pm 24$  vs  $74 \pm 18$  mmHg,  $p < 0.01$ ) compared to all other patients. Eighty-seven (9.4%) reached the composite outcome, and there was no difference between the two groups. Neither LVEDP nor perfusion pressure was a predictor of the composite outcome following multivariate logistic regression analysis (OR 1.01, 95% CI 0.98-1.04 and 0.99, 95% CI 0.98-1.01, respectively). Increasing age, CRI, CHF, and low left ventricular ejection fraction were predictors of the composite outcome following multivariate analysis.

**CONCLUSION** In hemodynamically stable patients presenting with ACS, LVEDP and coronary perfusion pressure are not predictive of in-hospital cardiovascular collapse. Routine measurement of LVEDP following PCI in stable patients may not be helpful to determine who will benefit from MCS.

#### CRT-100.09

##### Vasoactive Agent Use Prior to Acute Mechanical Circulatory Support for Cardiogenic Shock Is Associated with End Organ Dysfunction and Mortality



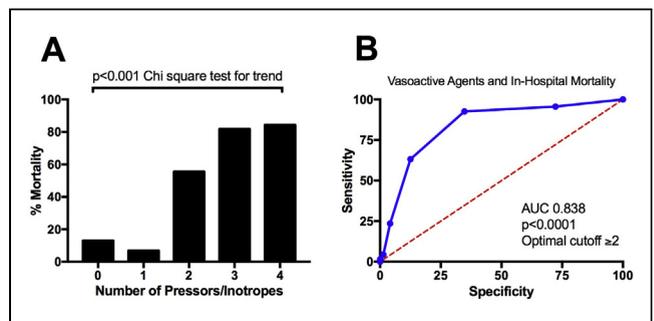
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**BACKGROUND** Prior to initiating acute mechanical circulatory support (AMCS) for cardiogenic shock (CS), vasoactive agents are used for hemodynamic support to avert multi-system dysfunction or hemodynamic shock. The relationship between vasoactive agent use for CS and clinical outcomes is not well-understood.

**METHODS** We retrospectively analyzed all patients (n=140) between 2012-2016 who received veno-arterial extra corporeal membrane oxygenation (VA-ECMO) (n=59) or Impella (n=81) for CS at two institutions.

**RESULTS** In-hospital mortality was 49%. Survivors were treated with fewer vasoactive agents ( $1.3 \pm 1.1$  vs  $2.2 \pm 1.3$ , all comparisons  $p < 0.05$ ; Fig. A). The most common first-line agents were norepinephrine, dobutamine and milrinone. There was no significant mortality difference at low, moderate, and high doses of pressors or inotropes. Compared to 0-1 agents, use of  $\geq 2$  agents correlated with a higher Cr ( $2.1 \pm 1.3$  vs  $1.4 \pm 0.6$  mg/dl), higher alanine aminotransferase (ALT) ( $663 \pm 1380$  vs  $222 \pm 653$  IU/L), aspartate aminotransferase (AST) ( $1265 \pm 3185$  vs  $331 \pm 1034$  IU/L), and international normalized ratio (INR) ( $1.9 \pm 1$  vs  $1.4 \pm 0.4$ ). Use of  $\geq 2$  agents correlated with a higher right atrial to pulmonary capillary wedge pressure (RA/PCWP) ratio ( $0.78 \pm 0.25$  vs  $0.63 \pm 0.23$ ) and lower pulmonary artery pulsatility index ( $1.23 \pm 0.78$  vs  $1.89 \pm 1.8$ ). Receiver operating characteristic (ROC) analysis revealed a C-statistic of 0.838 for in-hospital mortality with an optimal cutoff of  $\geq 2$  agents (Fig B).

**CONCLUSION** Vasoactive agents for CS are associated with impaired end-organ function, right heart dysfunction and increased mortality. The number of vasoactive agents may serve as a simple metric of CS severity and identify patients at risk of hemo-metabolic shock who may benefit from early initiation of AMCS.



#### CRT-100.10

##### Congestive Profiles Correlate with Clinical Outcomes Among Patients Requiring Acute Mechanical Circulatory Support for Cardiogenic Shock



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**BACKGROUND** The impact of congestive profile on clinical outcome in patients with cardiogenic shock (CS) supported by acute mechanical circulatory support (AMCS) is not well understood.

**METHODS** We retrospectively analyzed all patients (n=140) between 2012-2016 receiving veno-arterial extra corporeal membrane oxygenation (VA-ECMO) (n=59) or Impella (n=81) for CS at two institutions. Hemodynamic data were available for 106 patients and were used to categorize CS as euvolemic right atrial pressure (RAP) $<14$  and pulmonary capillary wedge pressure (PCWP) $<16$ , LV-dominant (PCWP $>16$  only), RV-dominant (RAP $>14$  only) or biventricular (BiV) congestion.

**RESULTS** BiV congestion (56%) was more common than LV-dominant (15%), RV-dominant (14%) or euvolemic shock (14%) (Fig. A). Compared to LV- or RV-dominant congestion, BiV congestion correlated with higher serum creatinine ( $1.94 \pm 1.12$ ,  $1.45 \pm 0.59$ ,  $1.64 \pm 1.15$  mg/dl,  $p < 0.01$  for all comparisons), aspartate aminotransferase (AST) ( $1178 \pm 3281$ ,  $588 \pm 1774$ ,  $299 \pm 257$  IU/L), alanine aminotransferase (ALT) ( $541 \pm 1264$ ,  $358 \pm 1041$ ,  $161 \pm 196$  IU/L), and lactate ( $5 \pm 4.1$ ,  $3.8 \pm 6.7$ ,  $4.3 \pm 2.6$  mEq/L). Euvolemic shock was associated with similar serum creatinine, AST, ALT and lactate compared to LV- and RV-dominant congestion. Mortality was similar among patients with BiV congestion managed with left- or right-sided Impella (44%), BiPella (40%), VA-ECMO without (43%) and with an LV venting strategy (60%). Compared to VA-ECMO, in-hospital mortality was lower among patients with LV-dominant congestion receiving Impella (0 vs. 67%;  $p < 0.01$ ; Fig. B).

**CONCLUSION** BiV congestion is common and associated with worse end organ function compared to univentricular dominant congestion among patients with CS supported by AMCS. Mortality was lower for patients with LV-dominant congestion supported by Impella. Improved understanding of hemodynamics in CS may allow for congestive profile-device matching and potentially improve outcomes.

